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A FEW REMARKS

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ON

"THE PRINCIPLE OF LIFE."

BY

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BEFORE WHOM THEY WERE READ.

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The present

The Principle of Life.

The subject of ~~to-night's~~ discussion—intricate, entangled, mysterious, incomprehensible—is one of the very last which I should have selected as a theme. At ~~the~~ bidding of ~~"The Crew,"~~ nevertheless, I plunge headlong into the profound and turbid inquiry, with very little hope of bringing up a pearl, however certain I may be of losing my breath in the vasty deep, and lacerating my fingers with the rough shells that contain the treasures sought by the diver.

"If," says Aristotle, quoted by Barclay, "the knowledge of things becoming and honorable be held deservedly in high estimation, and if there be any species of knowledge more exquisite than another, either on account of its accuracy or of the objects to which it relates being more excellent or more wonderful, we should not hesitate to pronounce the history of the Animating Principle justly entitled to hold the first rank." The belief in a definite "principle of life," thus announced, was in some form or other universal until of late days.—Whether material, etherial, or spiritual, it was assumed as a *necessary fact*, and indeed interwove itself with the current religious opinions so completely, that when Lawrence, the popular Lecturer of the London College, first denied it, he was denounced as an Infidel and an Atheist, and his Work laid under absolute sentence of outlawry. Now we can scarcely find any one among the more recent authorities who does not fully agree with him—and his prohibited book is mercilessly plundered without a syllable of acknowledgement.

What is meant by the phrase Principle of Life? I will give you a few of the definitions offered in modern times—

you

premising that this "term Principle," as Mayo remarks, "has been generally employed—as the letters of the Alphabet are by Algebraists—to denote an unknown element, which, when thus expressed, is more conveniently analyzed"—or, as I should prefer to say, examined in its several relations.

Willis attributes all living actions to the "Calidum innatum," as he phrases it—"a material element of an igneous nature"—and fortifies his opinion by quoting in its favor some of the highest names of antiquity, Hippocrates, Democritus, Epicurus, and Pythagoras.

"Scaliger and Fernel have imagined a superior Calidum Innatum as the Principle of Life—not the material igneous element of Willis, but "a more divine heat, spiritual, aerial, etherial, or composed of something elementary or etherial." Harvey, the discoverer of the Circulation, bluntly maintains that "the Blood is the animating principle or the substance, of which the anima, or life, is only the act." John Hunter, the most eminent example of "patient labor," after examining this subject with the most pains-taking and persevering attention, arrives at the conclusion that "there is a principle of life connected with all the parts of a living body, solid as well as fluid—a *materia vitæ diffusa*. Abernethy endorses this view—"My mind," he says, "rests at peace in thinking on the subject of Life, as Mr. Hunter has taught:" but he dwells with no little emphasis on what he calls the correspondence between "the phenomena of Electricity and of Life"—a hint caught at and labored much by Wilson Philip—and recently mumbled in the most myterious and significant way by the Mesmerists.* Cuvier tells us, "Life consists in the sum total of the functions." Bichat affirms it to be "*l'ensemble des fonctions qui résistent à la mort*." In the same spirit an old writer† points it out as "*illud putredini contrarium*." And Carlyle, speaking ironically of "some small soul," has

* Muller's Phys

† Junker Blumenbach.

quoted by

the same idea, "it saves salt." Lawrence maintains it to be "merely the active state of the animal structure." Carpenter defines it "the state of action peculiar to an organized body or organism." He intends, he says, "to designate rather the state or condition of the being exhibiting those actions than the actions themselves." He saw that his predecessor, Lawrence, whom he follows slavishly but ungratefully, had left unprovided for, the condition of "dormant vitality," in which living *action* is suspended. Sir Humphrey Davy* taught that "Life consisted in a perpetual series of corpuscular changes." Observe, I pray you, before we proceed any further, the extreme confusion made by these philosophers in mass between the vital actions and the vital principle—between the phenomena of life and the cause of this phenomena. "Life is a forced state," cries Brown. "Life," echoes Rush, "is the effect of certain stimuli acting upon the excitability and sensibility." The elephant is thus placed firmly enough on the back of the Tortoise—but when we ask what is *the force*, of Brown, and whence the "excitability and sensibility," of Rush, we are scarcely satisfied with a reference to "stimuli," which are incapable of affecting any form of matter unless previously endowed with the very properties which manifest the living condition.

Some of the confusion on which I am commenting, resides doubtless in the minds of the authors quoted—some of it is to be attributed to the imperfection of the French and English languages, in both of which the same word Life—la Vie—is used to express the cause and the effect. The Greeks† used the term $\psi\chi\eta$ to denote the cause of the vital phenomena— $\zeta\omega\eta$ to express the effect of that cause. We need this distinction.

"Life," argues Lawrence, "presupposes organization, as the movements of a watch presuppose the wheels, levers, and

* Good's Book of Nature, p. 102.

† Barclay.

other mechanism of the instrument." It is indeed true that the *movements* of a watch presuppose mechanism, and the phenomena of Life presuppose a specified organization through which they must be manifested; but it is equally true that without the principle of elasticity in the main spring of the former, and the "vital principle" in the tissues of the latter, there would be no "movement"—no "phenomena."

Reil, and after him Rudolphi, treat of it as a "subtle material superadded to the organism, making an original and essential difference in the form and composition of organic bodies."—Yet Reil speaks of Life as depending on this specific difference of composition and form. Muller Phys.

Broussais regarding contractility as "the fundamental property of the organic tissues," speaks of "the vital power or force as a first cause,* which *creates* that property and then employs it as an instrument."

constructs Prout, going back to the very Archæus of Stahl, announces it as "an ultimate principle," "an organic agent," "endowed by the Creator with a faculty little short of intelligence, by means of which it ~~constructs~~ the organism with which it is connected."

Muller describes it as "a principle—or imponderable matter—which is in action in the substance of the term—enters into the composition of the matter of this germ, and imparts to organic combinations properties which cease at death. He denies that there is any more obscurity in the physiological views of this subject than in the philosophical doctrines concerning Light, Heat, and Electricity.

I know not how better to "define my own position"—to express my own views as to this controversy, than thus: Life—Vitality—the Vital Principle—the cause of living action—is a primary and peculiar *property* of certain forms of matter—a *property* with which they are originally endowed. It is not as Artstotle taught, and Harvey and Willis believed,

a distinct internal element superadded to the structure of the body—nor a new substance as Girtanner suggests, perhaps Oxygen—nor a subtle something diffused through the solids and fluids—Materia Vitæ diffusa, as Hunter and Abernethy have argued—nor Electricity as the latter hints, and Wilson Philip thinks not improbable—nor a presiding genius, an Archæus, an almost or quite intelligent agent, as Stahl and Prout believe—nor a mere pre-established harmony, as Aristoxenus, Leibnitz, and Lusac maintain—nor the product of organization, as Lawrence, Pritchard, Holland, Mayo, and so many others contend—nor is it to be found as Cuvier, Rich-
erard ~~eraud~~, and Carpenter intimate, rather darkly I think. in the tout ensemble of the functions or any thing else—to borrow the Parliamentary phrase of Joseph Hume, “the *sum tottle* of the whole.”

I find a Supreme Being absolutely necessary in philosophy, as Robespierre did in social life—however philosophers and politicians may be annoyed by the idea.* I cannot imagine Vitality to be the result of any constitution, or arrangement, or composition of the structures to which it is found to belong. It is a property with which they are gifted by the great source of all powers, and is so far independent of such composition or organization, that it not only connects itself with conditions of structure or constitution, infinitely varied—nay, absolutely contrasted—but may be withdrawn, leaving all those conditions, so far as we are aware, unaltered. Let us humbly acknowledge that of this principle, in the abstract, we know nothing, and in all likelihood shall remain forever ignorant. He only who possesses within himself this mysterious attribute, and who of his infinite power and benevolence has communicated it to a part of his creation, can fully comprehend its nature and its essence.

The very simplest of its manifestations are inexpressibly difficult to understand or account for; and as we proceed in

* “*Tu commences m’embêter avec ton Etre Supreme,*” said one of his cotemporaries to the Man of Terror.

the inquiry, we are filled with a deep conviction that there is nothing in the vast storehouse of nature more calculated to awaken intense curiosity, to invite close investigation, and to give rise to solemn contemplation, than the construction and movements of a living body, fearfully indeed and wonderfully made, but still more fearfully and wonderfully endowed with almost infinite capacities for action, for enjoyment, and for suffering.

There are two qualities or properties which seem to be essentially and invariably connected with the presence of the Vital Principle, and infallible proofs of its active condition. These are motion—or rather motivity—the power of motion—contractility;* and the capacity of self-protection by positive resistance to,† or re-action against the influence of agents applied *externally*. I say *externally*, for I deny the correctness of Carpenter's view of this matter, when he declares that "the changes exhibited by any living being have one manifest tendency—the preservation of its existence as a perfect structure." Quite the reverse! however it may resist external agencies—all its *internal* movements and changes tend ultimately and with unerring certainty to its own destruction—it must inevitably wear out and die.

Inanimate masses of matter, unless impelled by some extrinsic force, must remain forever at rest. They possess within themselves no energy which can enable them to change their place, or even give rise to any alteration in the relative position of the atoms which compose them. Every particle, on the other hand, which is by any means endowed with Vitality; or is made a constituent portion of a living body, becomes at once a centre of motion, as it were—an impelling agent;‡ restless, active, and incessantly employed. The Monad—the Minute Animalcule—which among millions of his fellows finds abundant space in a single drop of water—Ehrenberg's points of life, of which mineral masses are

* The "only original organic force" of Brouesais.

† Impetum faciens.

compounded—these, when brought by the microscope within the reach of our vision, are known to be alive by their motions alone or chiefly. The first vivification of the larger germ is perceived in the *Punctum Saliens*—the organ of circulation which continues to throb and beat until its last pulsation is lost in the tranquil stillness of death. The thrusting forth of the corculum or sprout is our only test of the living condition of the vegetable seed, and difficult as it is to explain how plants propel their sap, we know that their juices are in constant agitation—absorbed by the roots, exposed in the leaves to the influences of air and light, and depositing every where in their course the materials of growth and increase.

The second of the essential living properties mentioned above—the capacity, namely, to resist the influence of external agents—is shewn in a great variety of modes. All living bodies enjoy a definite and regulated temperature of their own independent of the diffused caloric of the atmosphere. The blood of the *Mammalia* is about 98 deg. Birds are warmer than man—reptiles colder. The nose of a dog is always cold. The sap of a tree, throughout the severest cold of winter not only does not freeze, but retains its own proper degree of heat. The heat of a man's body does not rise a degree in an oven where meats are baked—nor fall a degree in a cellar of ice. A *Tenia* will live in boiling veal broth. Such facts are very numerous.

The play of chemical affinities, as shown in the ordinary processes of decay and decomposition, are efficiently resisted by the vital principle—this is indeed so definite a rule that there is no certain proof of death except the re-establishment of those chemical laws in their operation upon the materials of which living bodies are composed, and their consequent putrefaction. How strangely interesting, in this point of view, the condition of *Dormant Vitality*—suspended animation. Seeds* kept in the herbarium of Tournefort more

* *Cy. Anat. and Phys.—Life.*

than one hundred years, were found fertile. Professor Lindley says that Raspberries were raised from seeds taken from the stomach of a man whose skeleton was found thirty feet under ground, buried with some coins of the Emperor Hadrian; whence it is probable that the seeds were 1600 or 1700 years old. Nay, not only seeds, but Bulbous Roots, found enclosed with mummies in their Egyptian envelopes—perhaps in a seclusion of 3000 years—produced fac similes of their parent plants. Similar stories are told us of the ova of many animals. The infusory animalculæ seem to be capable of an indefinite protraction of dormant life. The Rotifer,* for example, may be dried so completely as to splinter when touched with the point of a needle, and in this state would remain perhaps for 1000 years—but revives readily when moistened again. Every one knows Dr. Franklin's experiments on the drowning and revival of flies. Lister and Bounet have seen caterpillars revive that had been so frozen that when dropped into a glass they chinked like stones; and fish in Northern Europe are transported great distances frozen alive. Not to speak of the hybernation of the higher orders, which is not a state of entirely suspended animation, the same tenacity is strangely shewn in certain well authenticated recoveries from drowning—but most fearfully in what is called "trance"—a state in which many persons apparently dead have been buried alive. Pliny mentions a young man of rank, who falling into this condition, was placed upon the funeral pile. The heat of the flames revived him; but he perished before his friends could rescue him. The great Anatomist, Vesalius, had the inexpressible misfortune to commence the dissection of a living body, apparently dead. Less unhappy was the fate of the Abbe Prevost, who fell apoplectic, but recovered his consciousness too late, alas! under the scalpel.

Cardinal Somaglia being apparently dead, preparations

* Carpenter ut supra.

were made to embalm his body. But the operator had scarcely penetrated into his chest, when the heart was seen to beat. The unfortunate patient, returning to his senses, had still sufficient strength to push away the knife of the Surgeon, but too late; for the lung had been mortally wounded, and the patient died in a most lamentable manner. Walker's Gatherings from Grave Yards, p. 193.

The industrious Bruhier collected no less than fifty-two cases of persons buried alive—four dissected prematurely—fifty-three who recovered after being confined—and seventy-two falsely considered dead. ~~In one of our own Churches is~~ The monument of Rev. Wm. Tennent, who lay three days in his shroud, and was saved from interment almost by miracle. * The individual entrusted by the French Government with the removal of the dead from the Cemetery of Innocents, at Paris, reported that he found many of the skeletons in postures that demonstrated their resuscitation and partial turning in their coffins.

Carpenter denies strenuously that there is any necessity for supposing a new force, principle, or law, to account for vital phenomena, and ascribes them all to the known properties of matter, and the familiar laws of mechanical and chemical affinity, attraction and repulsion, action material and passive, reciprocal and catalytic. Such, doubtless, is the current tendency of the prevailing philosophy. Every thing is explained by changes of composition. The brain, according to Liebig, is altered chemically by every atom of opium taken into the stomach, and a new train of vital actions must follow this change in chemical composition and minute organization. Daubeny also favors very decidedly this chemical view of Life and its actions.

* Shakespeare makes Ceremon in Pericles say—
 "Death may usurp on Nature many hours
 And yet the fire of life kindle again
 The overpressed spirits. I have heard
 Of an Egyptian had nine hours lien dead,
 By good appliance was recovered."

of our history

But how are we to understand the arrest of action here? The elements, with all their affinities and repulsions, are present or in contact; what suspends their influence upon each other? The favoring contingencies of the presence of air and heat, nay all the ordinary and extraordinary agents of decomposition are thus defied.

There is not a little weight in the well known fact that none of the products of organic action (Vital Chemistry as some have chosen to call it,) have been successfully imitated in the Laboratory. I say *none*. I am aware that Urea is affirmed to have been formed by the processes of inorganic action out of the body, but besides the chances of error in the statement of experiments so new and so seldom repeated, we must remember, with Muller, that this substance is a pure excretion, and does not in any manner enter into the composition of a living body; it can hence, scarcely with any propriety, be regarded as organic. Carpenter himself says, that though "it may be possible for a Chemist to produce the gum or sugar which he finds in the ascending sap of plants, he can never hope to imitate the latex or elaborated sap, which already shows traces of organization and of vital properties." Why not! if their composition results from the same familiar processes and laws?

I have hitherto been speaking, as you doubtless have remarked, of the very lowest of the vital principles—those which may be specially indicated as distinguishing living from inanimate matter. These properties constitute indeed the only bases for such distinction; and the most carefully drawn definitions founded on any other, fail of accuracy and clearness. Thus when Kant tells us "that the cause of the particular mode of existence of each part of a *living body* resides in the whole, while in dead masses each part contains this cause within itself"—he forgets the beautiful series of *crystals*, each portion of which constitutes as much as, in a living creature, a necessary part of the whole. Others speak of organized bodies as exhibiting a symmetry consisting in the correspon-

dence of curved lines or outlines, while inorganic symmetry is always rectilinear.

There is indeed—define it as you will—a wide chasm separating the animated from the inanimate portion of created things. To all animated nature belong the powers of increase or growth; so prominently indeed is this last function placed among the vital offices, that Virey contends that “Life is never the property of the individual, but belongs to the species,” and indeed the act of transmitting it is often both in plants and animals the first, last, and only notable purpose of existence.

Inanimate masses, on the contrary, form no species—each individual exists separately—increases, or diminishes, or changes its form, under the control of external causes exclusively—grows and changes by external accretion only, and by juxtaposition of particles, whether regularly or irregularly, whether shapeless lumps or exact crystals.

It is the melancholy privilege of living beings to die—and the very pabulum and stimulant influences which elicit life and develop the highest functions of vitality, conduct most rapidly and certainly to death.

Balnea, Vina, Venus, ~~Corrumpunt~~ ~~Corpora~~ ~~Xana~~,
Corpora ~~Xana~~ dabunt Balnea, Vina, Venus.

Baths, Woman, Wine, our life sustain,

Baths, Woman, Wine, our vigour drain.

Inanimate masses, on the other hand, require no sustenance, and if unassisted by violence from without, would, so far as we know, endure to all eternity.

But from the lowest class of organized beings up to man, who is himself “but a little lower than the angels of heaven,” the gradation in the scale of existence is so regular, and the steps so slight, that we are even unable to draw with clearness and precision the line which separates the Animal from the Vegetable kingdom, or point out satisfactorily the distinction, if any there be, between Animal and Vegetable life. Many* of the Zoophytes, or Plant Animals, ~~were~~ arranged

* Good,—77.

first as minerals by Woodward and Beaumont—then received by Ray and Lister as vegetables—and are now classed among animals rather on account of their chemical properties than for any other reason. The Algæ indeed are refused admission here—Chemistry notwithstanding—by no less authority than Ehrenberg.* Strangest of all, Nitzsch† tells us that of the same genus, Infusoria, some species as for example the *Bacillaria Pectinalis*, have the characteristics of Plants, while others are clearly enough Animals. The uncertainty of the chemical tests and their inapplicability here are best shewn by the fact that there are at least two vegetables as incombustible as minerals—the *Fontinella Antipyrectica*,‡ used in northernmost Europe for lining chimnies—and the *Byssus* (asbestos,) a moss found in the Swedish copper mines which vitrifies when exposed to a red heat. Mirbel, Smith§ and Richeraud, offer the following distinction: “That Plants derive nourishment from inorganic matter—earths, salts, or airs; animals live upon matter already organized.”—“Plants,” says Richeraud prettily enough, “may therefore be considered the laboratories in which Nature prepares aliments for animals.” This striking harmony of relation is undoubtedly the rule; but there are many exceptions. The Earthworm, and numerous other tribes, it is said, live upon the mineral kingdom—and Humboldt tells us of some of the wretched nations of Southern America, that subsist, at least for considerable portions of time, upon clay. Contractility is evidently common to both orders; and of obvious locomotion—the sensitive plant, the *Hedysarum Gyrans*, the *Orchis*, the *Scab*¶, and the *Valisneria*, are affirmed not only to exhibit spontaneous motion of leaf and stem, but the three latter move from one place to another, while several instances of animal species are known to which Nature has denied both loco-

* Muller's Phys. in loco.

† Muller's Phys. in loco.

‡ Good,—78.

§ ~~Good,—78.~~

motion and every mark of consciousness or sensation.* The ingenious author of "the Philosophy of Nature,"† observes, that "Vegetables have the *consciousness* or *sensation* of actual and present existence; animals unite to this sense the memory of the past; but it belongs to man alone to combine these two sentiments with that of the future." This view of the matter, however, is more poetical than philosophical. Our imagination delights in the idea that all nature is full of glad or tranquil consciousness of pleasurable existence.

"It is my faith that every flower
Enjoys the air it breathes"—

Says the contemplative Wordsworth; and our own Bryant sings not less melodiously—

—————"Even the green trees
Partake the deep contentment, as they bend
To the soft winds; the sun from the blue sky
Looks in and sheds a blessing on the ~~sun~~ *seem*
Scarce less the cleft-born wild-flower seems to enjoy
Existence, than the winged plunderer
That sucks its sweets."

We know little of the extension of the sentiments through the very lowest of the animal orders, though we have it on the authority of the universal Shakspeare, that "an oyster may be crossed in love." But the doctrine which ascribes to man exclusively the feeling of hope or anticipation, must be abandoned when we reflect that all domestic animals expect their habitual feeding time with impatience, and press homeward with eagerness from abroad—not to dwell upon the promptings of instinct, which lead to the building of nests and the migrations of the feathered tribes, and the hoardings of food, and the conversion by peculiar feeding of the immature insect into a Queen Bee.

By thus regarding the principle of life as expansive, the Speculatists have come to confound it, as developed in the

* Good,—77. Linnæus' class of Vermes.

† Tourtelle.

higher orders of creation, with the reasoning and moral faculties—a confusion displayed in the very terms and phrases universally employed in discussion.

The word *Psuche*—which, as I have said, denoted among the Greeks the cause of the phenomena of life—meant indiscriminately the soul or the vital principle. In Latin, *Anima*—and in English, *Soul*—are often used in the same way.—Thus the Philosophical Poet,

“*Spiritus intus alit ; totamque infusa per artus
Mens agitat Molem*”

And our translators of the Bible*—“He breathed into his nostrils the breath of life, and man became a living soul.”—Aristotle,† aware of the necessity of nice distinctions here—though he does not attempt to make them—asks “under which of the categories does the vital principle fall to be arranged? Is it a substance—a quality—or a quantity? Are all souls of the same—or are there different species? Men, when they speak of the soul, mean the human soul; but will the same language and description apply in all cases? Or would not rather every species require a separate and specific definition—as the soul of a horse or dog, the soul of a plant, or of a wild beast?” A modern writer, Grew, proceeding upon this train of thought, suggests that “the several species of Life seem to be reducible unto these three—Vegetable life, Sense, and Thought.” Rush falls headlong into the same confusion, and regards Grews’ and Aristotles’ “several species” of Life as only differences of degree of developement or perfection. “Perfect life,” he says, “is composed by the union of motion, heat, sensation, and thought”—and then goes on, “it”—life doubtless—“it may exist without thought, sensation, or heat—but none of these can exist without motion.”

Among the Physiologists who admit of a separate Principle of Life, Abernethy and Dermot alone exhibit any anxiety to

* Genesis 2 : 7, and 2 Cor 15 : 45 “The first man Adam was made a living soul.” Esdras 16 : 61. Ecclesiastes 3 : 18–21.

† Barclay.

distinguish from each other the Vital merely and the Intelligent principle—the first to be found in vegetables and the lower order of animals—the latter met with in man and the creatures which approach him nearly. “If,” says A., “Philosophers would once admit that Life was something of an invisible and active nature, superadded to organization, they would then see equal reason to believe that mind might be superadded to life as life is to structure.” Dermot, if I understand him properly, goes further, and supposes three great orders of animated nature. 1. The vegetable, and perhaps the Zoophyte, endowed with mere life. 2. A rank of animals above these, gifted with intelligence, sentient, and capable of thought. 3. And lastly man, in whom a third principle is paramount—the true soul—the moral agent—responsible—capable of wrong and right—of vice and virtue.

During the prevalence of the opinion that Life and the Soul were the same—that the source of animation and intelligence was a unit—some well-meaning philosophers, in their zeal “to vindicate the ways of God to man,” were fain to take refuge in a hypothesis proposed by Des Cartes, with regard to the phenomena of life in the lower animals, viz. “That they have no souls at all—and that all the appearances which they exhibit of sense and vitality, are only deceptions; like the motions of a puppet, the mere effects of mechanism; that being thus mere automata they are utterly indifferent to the hardships and cruelties inflicted on them by our notice and neglect, and by the nature of circumstances which they can neither foresee nor control.”

The received doctrine of the present day, counting among its supporters Cuvier, Lawrence, Richeraud, Holland, Pritchard, Mayo, and Carpenter, as I have already said, is, that Life is a mere quality—the result of organization. Vitality is declared to be “invariably found connected with some of the modes or forms of organization; shewing itself when these are first developed; coming to perfection as they are perfected; modified by their various changes; decaying as they

decay ; and finally ceasing when they are destroyed." Hence it is inferred to be nothing more than a series of effects, of which organization is the origin and cause—a deduction which I have maintained to be erroneous and untenable.—Indeed it seems to me far more reasonable to believe on the contrary that organization is the product—the result of the active condition of a principle of Vitality, the fons et origo of all the movements which constitute outward or visible life.

"La Vie," says Cuvier, somewhat inconsistently,* "ne naît que de la Vie." Hence the germination of a seed; hence the miraculous creation of the bird within the egg; hence the pullulation of a cutting or bud or shoot of a plant—its thrusting forth roots and tendrils—its obvious search for support, for light, and for water; hence the healing of wounds; the restoration of lost parts, as of the claws of the Lobster and Crab, and of the whole head of the snail when decapitated, and the annual renewal of the horns of the Stag. In the Polypus, however mutilated and severed into fragments, this active, I might almost say, creative principle, remodels in each part and completes the deranged and mangled organization. These wonderful phenomena seem to me to exhibit in their obvious analogy—may I not say in their ultimate simplicity?—a common cause identically the same in all living creatures from the Mammoth down to the minutest Animalcule—from man, the very image of his Maker, down to the worm that builds the coral reef—the Medusa that sparkles on the midnight surface of the glowing ocean—the scarcely visible lichen that covers with its velvet growth the time-worn masses of rugged rock. The principle of Vitality is in all the same—through both the animal and vegetable kingdoms; but so vastly numerous and diversified are the manifestations of its presence and power, that time would fail me were I to attempt to recount the thousandth part. It feels in the sentient extremity of the

* Pace tanti Viri.

nerve—it contracts in the muscle, and flows in the blood. It beams forth in the sweetest smiles of health, cheerfulness, and beauty; it produces the distortions of deformity, disease, and despair.

How difficult to understand or grasp the notion that the vitality of every living atom—whether fluid, as in the blood of animals, and the sap of vegetables—semi-fluid and gelatinous, as in the Polypus and most infusories—or solid, as in wood, bone, and muscle, merely results from its composition, arrangement, and relative position in the structure of which it forms a part! When instantaneous death has followed the application of a drop of strong Prussic Acid to the eye or tongue—what change has taken place in this composition, arrangement, and relative position?—what, when a man has fallen dead from a sudden blow on the pit of the stomach?

Two persons are drowned at the same time—at the same time rescued, and subjected at once to the same processes of restoration. In one case your efforts are crowned with success—in the other they fail. Of the first you say truly that animation was only suspended—of the latter that the subject was absolutely dead. Yet both were alike cold, motionless, insensible. What, then, constituted the infinite difference between them? You can shew nothing. The most minute dissection discloses no lesion or destruction of any part in him who was insusceptible of restoration. No portion of the anatomical structure is perceptibly deranged. In the language of John Hunter, “the dead body has all the composition it ever had”—its organization is, to all appearance, as perfect as ever, but “the effect of this cause” has ceased, and life has left it never to return. Carpenter pronounces dogmatically that Hunter is wrong here, and that the minute structure or intricate condition of the organism must have undergone a change in death. He reasons in a vicious circle, however, and makes no effort to sustain the burden of proof which fairly lies upon him. He is bound to prove that such change has

taken place, and the mere assumption cannot be admitted. *De non existentibus et non apparentibus eadem est ratio.*

As among the most remarkable of the phenomena of the living condition, Sleep and Death demand from us a brief notice. "Half of our days," says Sir Thomas Browne, "we pass in the shadow of the earth, and the brother of Death extracteth a third part of our lives." There is no analogy in truth between these two states—which both Poets and Philosophers have loved to confound. The pious Moore was so struck with the resemblance—surely but a slight one—that, as he tells us, he dared not trust himself to sleep without a solemn prayer. Shakespeare writes of "the sleep of death." Bichat says that sleep is a partial death, and death the sleep of all the organs.

Sleep is, in fact, nothing more than a periodical arrest of the expenditure of vital power. The functions of organic life never sleep. Circulation, Respiration, Assimilation, go on perfectly, while "tired Nature's sweet restorer—balmy sleep," closes up the avenues of our animal or external relations, through and out of which our lives, while we are awake, pour from us in a constant stream. Many vegetables sleep, it is said—and probably all animals. At any rate it is certain that none of the higher orders could exist long without this alternation of repose—and rest from actions that weary and exhaust them. Sir John Sinclair, in his researches into the history of longevity, found that there was but one point of agreement among his old people—they had all slept much and soundly!

Of Death we must not understand a mere negation of life; it implies previous animation; it is the result of certain changes to which all living nature is inevitably subject, and which inanimate masses cannot undergo. Euthanasia commences with a loss of the power of motion—the genial warmth diminishes—the circulation of the fluids becomes languid, and gradually ceases, and the vital spark is finally extinguished. This cessation of action, however—this apparent loss of

power—this insensibility and awful stillness—though invariable attendants upon the King of Terrors, and manifest tokens of his presence, do not philosophically or physiologically constitute Death; for, as before stated, we meet with them all concurring in certain cases of suspended animation or dormant vitality, when the subject is still capable of being resuscitated.

Hence then, regarding Excitability as the chief constituent or essential characteristic of Life, if indeed it be not merely another name for the very principle of vitality—so I would define Death to consist in the loss of susceptibility to the impression of stimuli or agents of excitement.

Death is thus the counterpart of Life—yet a necessary termination—an unavoidable result of its restless action within and upon an organism composed of such frail and destructible materials. In a future state of existence we trust—this corruptible shall put on incorruption, and “Death shall be swallowed up,” and this mortal shall be clothed with immortality. Then the renewed principle of Vitality, deriving exhaustless energy directly from the Great Fountain of Life, shall continue in eternal activity in “that spiritual body” of which we read—doubtless an ineffable mode of organization, ennobled and purified.

NOTE.—I find that in the reference to the Rev. William Tennent, (on page 11,) I mistook the father for the son. The story—a very interesting one—will be found in the “Panoplist,” volume 2d.